CENTRAL INTELLIGENCE AGENCY
INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

50X1-HUM

COUNTRY	USSR	DATE OF INFORMATION	1950
SUBJECT	Scientific - Electricity, telemetering		
HOW PUBLISHED	Monthly periodical	DATE DIST.	3 Oct 1950
WHERE PUBLISHED	Moscow	NO. OF PAGES	4
DATE PUBLISHED	Feb 1950		
LANGUAGE	Russian	SUPPLEMENT TO REPORT NO.	

THIS IS UNEVALUATED INFORMATION

SOURCE Elektricheskiy Stantsii, No 2, 1950.

TRANSMISSION OF PULSES FOR TELEMETERING TOTAL POWER WITH HIGH-FREQUENCY CURRENTS ALONG A HIGH-VOLTAGE LINE.

Engineer, M.L. Bunevich

/Figures referred to are appended./

In the Molotovenergo system, a telemetering apparatus which transmits total-power telemetering pulses by hf (high-frequency) currents along a high-voltage electric transmission line has been constructed and put into service. It uses an existing hf telephone communication channel, without adapting it for the frequency at which telemetering takes place.

Figure 1 shows the method of connecting the VChA-2 transmitter at the transmitting end to the hf telephone communication channel.

When this method is used for connecting the VChA-2 telemetering pulse transmitter to the hf lead-in of the DPK-20 receiver-transmitter at the transmitting end, it is possible for both transmitters to work simultaneously without appreciable losses of hf power by the VChA-2 or DPK-20 transmitters and without effects due to mutual interaction through the output circuits.

This is because two filters tuned to parallel resonance are inserted in the hf leakage path from the DPK-20 transmitter to the VChA-2 transmitter. One of them is for the frequency of 63 kc radiated by the DPK-20 transmitter; the second for the incoming frequency of 91.5 kc.

Leakages of hf energy from the VChA-2 telemetering pulse transmitters do not occur because these circuits, tuned to series /sic/ resonance at the two extreme frequencies of 63 and 91.5 kc, are tuned to parallel resonance for yms (root-mean-square) frequency. The VChA-2 telemetering pulse transmitter works at this last frequency, which is practically 81.5 kc.

STATE	X	NAVY	X	NSRB		DISTRIBUTION					
ARMY	X	AIR	X	FBI							

CONFIDENTIAL

A third series circuit, shown in Figure 1, is tuned to the rms frequency of 81.5 kc and serves as compensation for the characteristic impedance of the hf line 167 meters long and the reactance of the coupling condenser through which the VChA-2 and DPK-20 transmitters are connected to the electric transmission line.

The system used for connecting the pulse receiver to the hf lead-in of the DPK-20 at the receiving end is shown of Figure 2.

All that has been said concerning the method of connecting the VChA-2 telemetering transmitter at the transmitting end applies to the method of connecting the receiving device at the receiving end. In this case, the method, in conjunction with the use of a pulse receiver of the given design, makes it possible to tune out completely any interference entering the DPK-20 from the hf telephone communications channel at the receiving end.

An old hf instrument of the Laboratory imeni Smurov in Leningrad is used as the VChA-2 transmitter. It was originally intended for use in directional protection circuits with hf interlocking.

For the transmission of telemetering pulses by hf currents, the transmitter was somewhat modified to increase its oscillation power. This modification consisted in connecting the Type TO-143 tube of the master oscillator and the Type GO-5 reserve oscillator tube for permanent, simultaneous operation in parallel with the existing tubes. After this modification, its oscillating power was about 10w. In the future, it is proposed to change a metal tubes with full supply from an ac line.

The receiving device consists of a five-tube superheterodyne using metal tubes operating on ac. The plate current of the Type 607 output tube varies in time with the incoming hf telemetering pulses from its maximum value to zero. In other words, during the pulse duration the plate current falls to zero, but the full plate current flows throughout the pause between pulses. A polarized relay is included in the plate circuit of this tube which, following the plate current variations already mentioned, reproduces the so-called secondary pulses, accurately repeating the primary pulses of the transmitter.

This receiving device allows normal operation of the output receiving relay when the hf current from the pulse transmitter changes from 315 to 15 ma. Thus, with respect to the level of the incoming hf telemetering pulses, the receiving installation has a reserve factor equal to 21. The sensitivity of the pulse receiver, according to a standard signal generator, is 18 microvolts.

The primary pulses at the transmitting end are created by a three-phase ac counter (meter) from which the counting mechanism has been removed. A commutator-interrupter is mounted on the axis of this meter which interrupts the supply circuit of the auxiliary coding relay. One turn of the meter disc produces six makes and six breaks of the relay's supply circuit. The code relay in turn, in time with the makes and breaks in its supply circuit, makes and breaks the plate supply circuits of the VChA-2 transmitter, thus providing for its pulse operation.

The current windings of the three-phase meter, which creates the primary pulses, are connected to the secondary windings of the integrating current transformers, whose primary windings are by-passed by the secondary current from the current transformers of the oscillators. The voltage windings of the transmitting element are connected to the secondary voltage of the voltage transformers.

CONFIDENTIAL

CONFIDENTIAL

Sanitized Copy Approved for Release 2011/09/14 : CIA-RDP80-00809A000600350137-1

CONFIDENTIAL

As the receiving device is installed at a substation 5 km from the dispatching point, a connecting line was needed. The connecting line between the central control switchboard and the substation switch-board was used for this purpose. The current pulses from the output relay of the receiving device are applied to the midpoint of the differential transformer at one end of this line and act on a polarized relay (through another differential transformer) connected at the other end. The relay contacts are connected to the circuit of the indicating instrument through condensers of fixed capacitance. The charging current for these condensers and, consequently, the readings of the indicating instrument, is directly proportional to the frequency of the pulses.

Figure 3 is a schematic diagram showing how the output relay of the receiving device is connected with the pulse converter through the connecting line.

This method of combining the transmission of telemetering pulses of total power and hf telephone communication along one channel, accomplished without supplementary redesigning of the existing hf telephone communications channel, resulted in great savings. The long-distance telemetering system described operates along the same channel with the hf telephone circuit uninterruptedly and without interference.

/Appended figures follow:/

CONFIDENTIAL

50X1-HUM

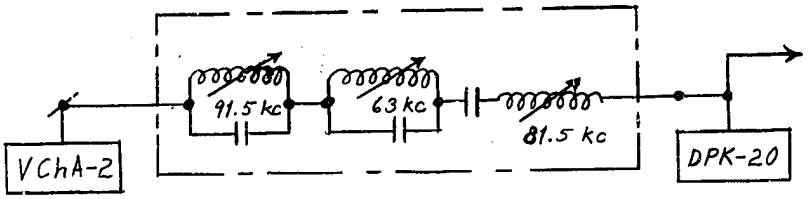

Figure 1

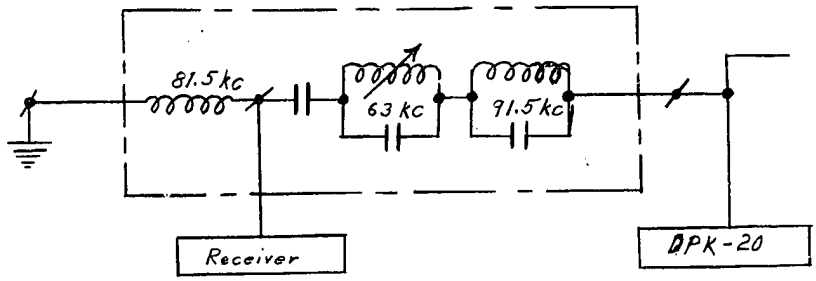

Figure 2

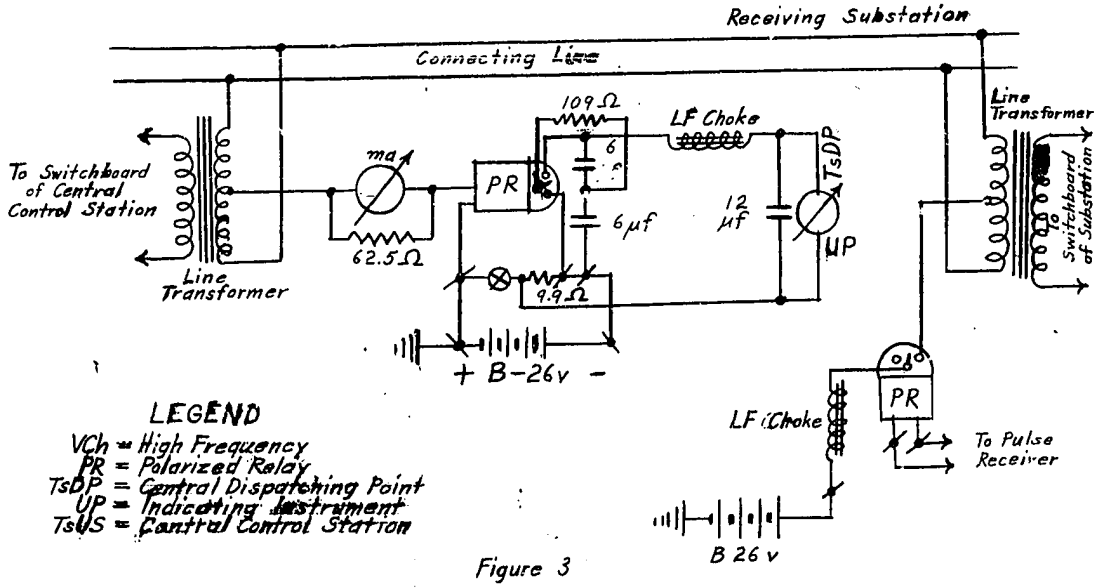

Figure 3

- E N D -

CONFIDENTIAL

CONFIDENTIAL